

The background image is a seascape under a dramatic, dark sky. A bright light source, possibly the sun or moon, is visible on the horizon, creating a strong lens flare and illuminating the water. The sky is filled with dark, swirling clouds. The water is dark blue with visible ripples. A white diagonal line runs from the top left towards the bottom right, intersecting the horizon. The title text is overlaid on the upper right portion of the image.

# Impacts of Climate Change on Public Health

# Elements of the Review

- ❑ Impacts of climate change on regional air quality
- ❑ Air pollution-related health effects
- ❑ Heat-related mortality
- ❑ Impacts of increased wildfire frequency
- ❑ Incidence of vector-borne diseases
- ❑ Possible adaptation strategies



# Impact of Climate Change on Regional Air Quality\*

- ❑ Assess the change in frequency of meteorological conditions conducive to high air pollution events
- ❑ Examine the impact of changes in temperature, relative humidity, and inversion height on ozone and PM concentrations

\*Prof. Michael Kleeman – University of California, Davis

# Effects on Regional Air Quality - Methodology

- ❑ Use statistical model to analyze historical correlation of GCM outputs and air pollution events
- ❑ Predict frequency of meteorological conditions conducive to air pollution events during future climate conditions
- ❑ Apply state-of-the-science regional air quality models for San Joaquin Valley (SJV) and South Coast Air Basin (SoCAB) to examine impacts of changes in meteorology



# Effects on Regional Air Quality - Deliverables

- ❑ Estimated frequency of meteorological conditions typical of severe air pollution in SJV and SoCAB corresponding to the global climate change emission scenarios for 2020 to 2100
- ❑ Estimated range of changes in ozone and PM concentrations due to meteorological variability under current conditions

# Air Pollution-Related Health Effects

- ❑ Estimate changes in health endpoints based on projected changes in air quality and climate
- ❑ For ozone and particulate matter:
  - Death
  - Hospital admissions
  - Emergency room visits
  - Asthma attacks
  - School absences
  - Minor restricted activity days



# Health Impacts Methodology

- ❑ Apply accepted concentration-response functions to changes in air quality
- ❑ Calculate estimates with ranges
  - Express health impacts as % change compared to current impacts estimates
- ❑ Acknowledge uncertainties

# Other Climate-Related Health Effects – Literature Reviews

- ❑ Heat-related mortality (already estimated for California)
- ❑ Wildfire health effects
- ❑ Infectious diseases



# Potential Adaptation Strategies

- ❑ Changes in social, behavior, and activity patterns
- ❑ Increased use of air conditioning
- ❑ Land use patterns
- ❑ Public health education programs
- ❑ Heat and air quality emergency action plans

# Public Health Impacts Deliverables

- ❑ Estimation of air pollution-related health impacts and associated uncertainties
- ❑ Review of other climate-related health impacts
- ❑ Discussion of potential adaptation strategies
- ❑ Economic costs of outcomes